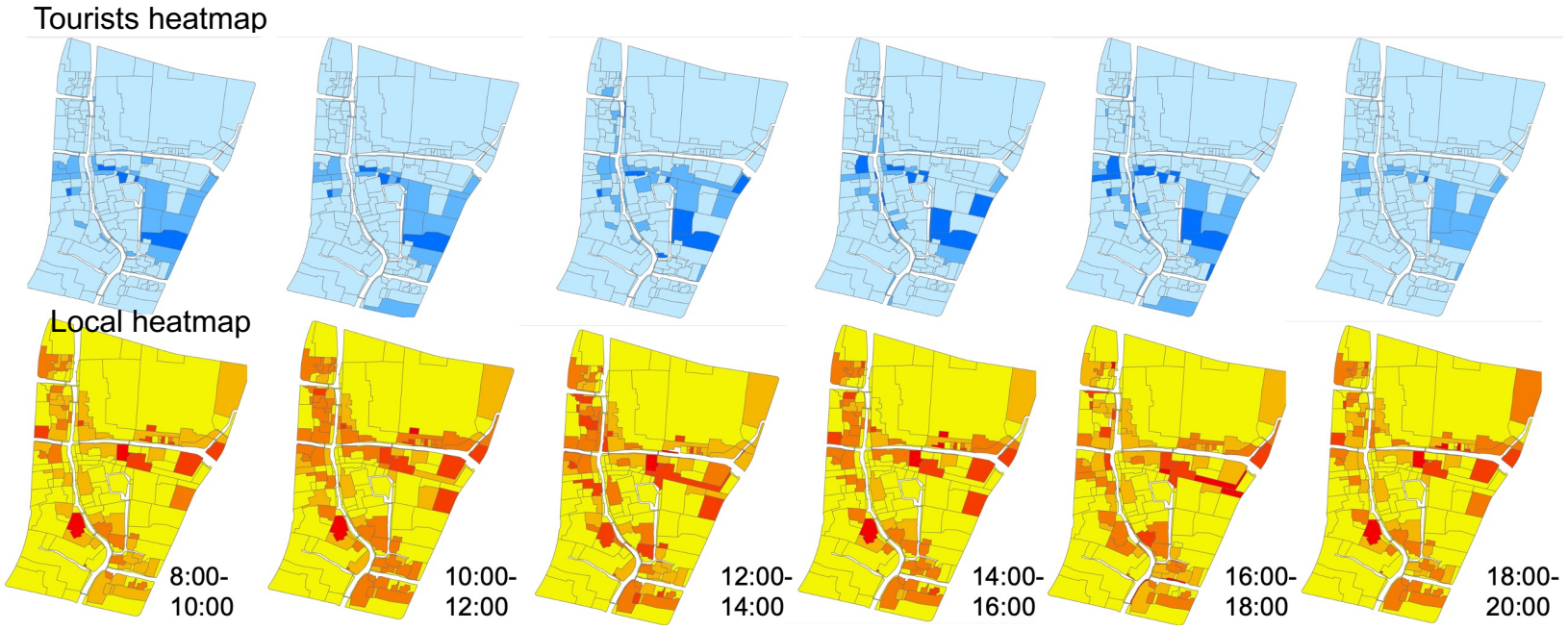
Social scenario simulation based on the ABM model

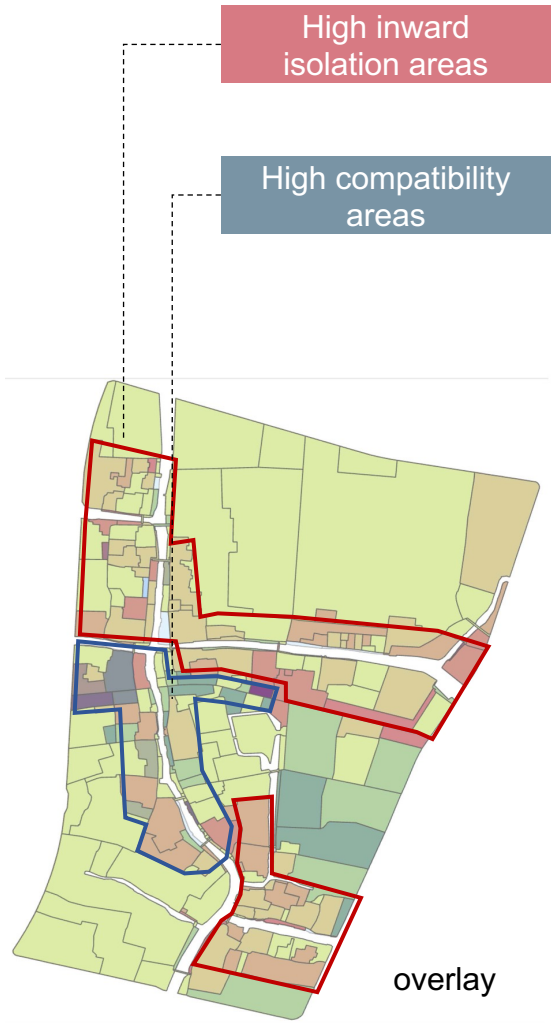
- How does the model capture the spatial dynamics of various groups' activities on a daily basis?
- How does the model identify high social risk areas?
- How does the model support land-use planning to optimize social resilience?

Social scenario simulation based on the ABM model

Single-day simulation results

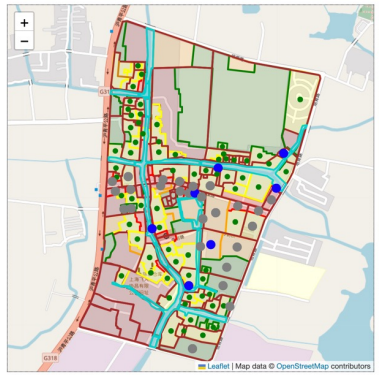
- Tourist activities are concentrated along Jinxi Road and the riverfront areas.
- Local residents are predominantly distributed along the river.
- This reveals a spatial social mismatch between the two groups: there is an excessively high overlap of activities along the river south of Jinxi Road, while the areas to the north exhibit a homogenization of group types, particularly along the transverse riverbanks.



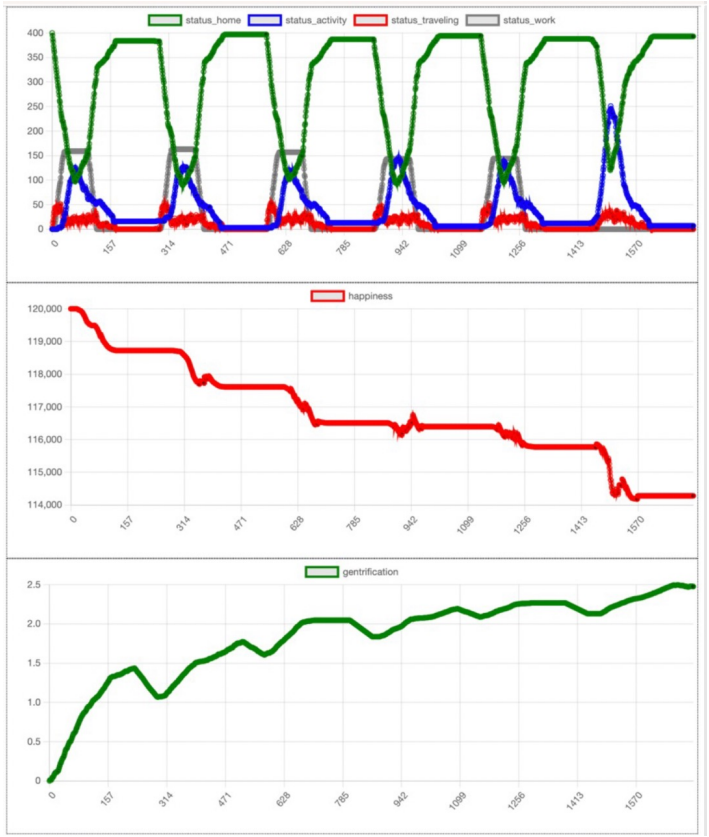


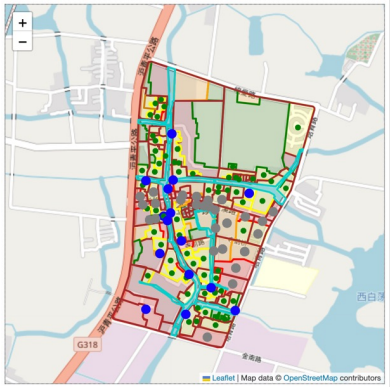
Social scenario simulation based on the ABM model

Land Use Plan Optimization

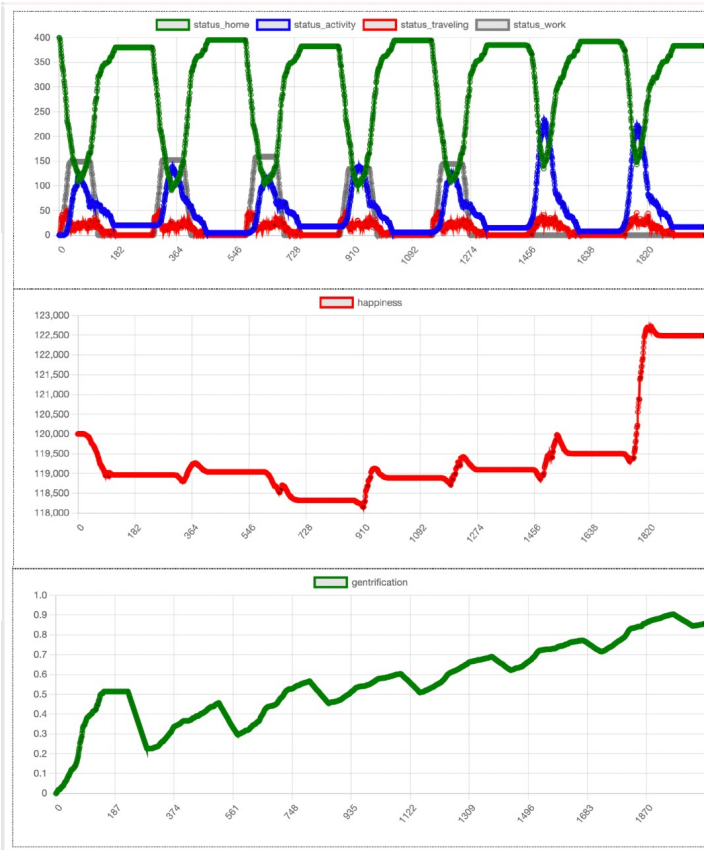


Current plan





Optimized plan



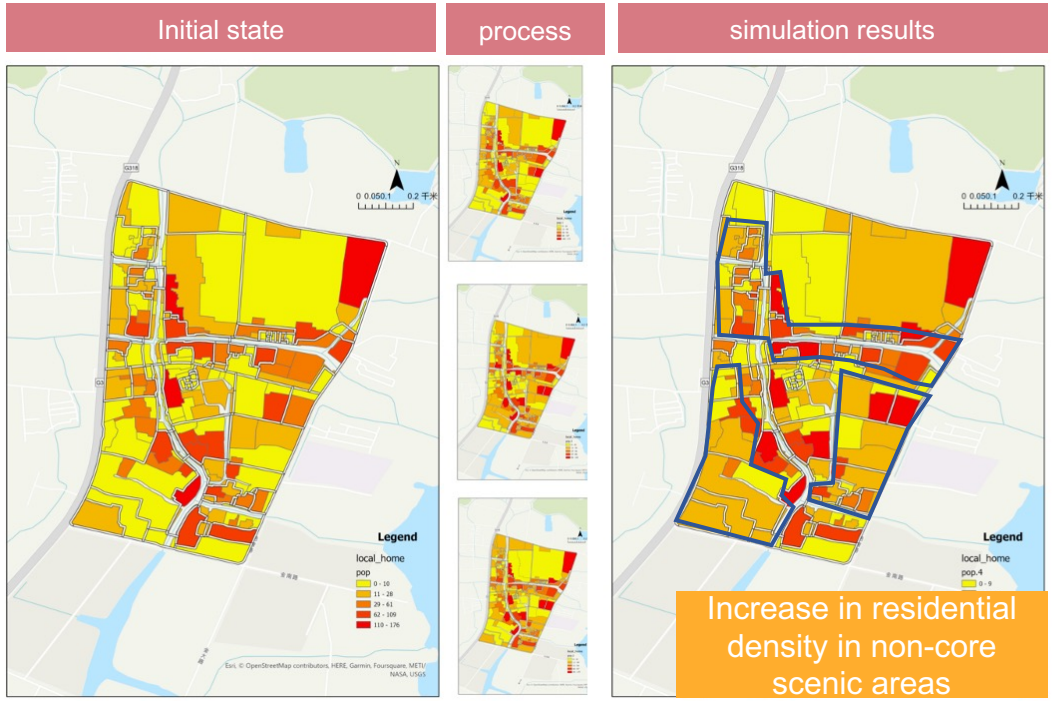
- The **uneven distribution** of the three population groups makes it difficult to reach the happiness threshold range, showing a trend of decline-stabilization-weekend decline.
- The social displacement risk index of the plot tends towards 2.5 (a 2.5% probability of relocation).

- By adjusting the function and structure to balance the distribution of social scenarios, happiness **remains stable** during daily life, and the weekend impact transforms into weekend benefits.
- The social displacement risk index of the plot trends towards 1.0.

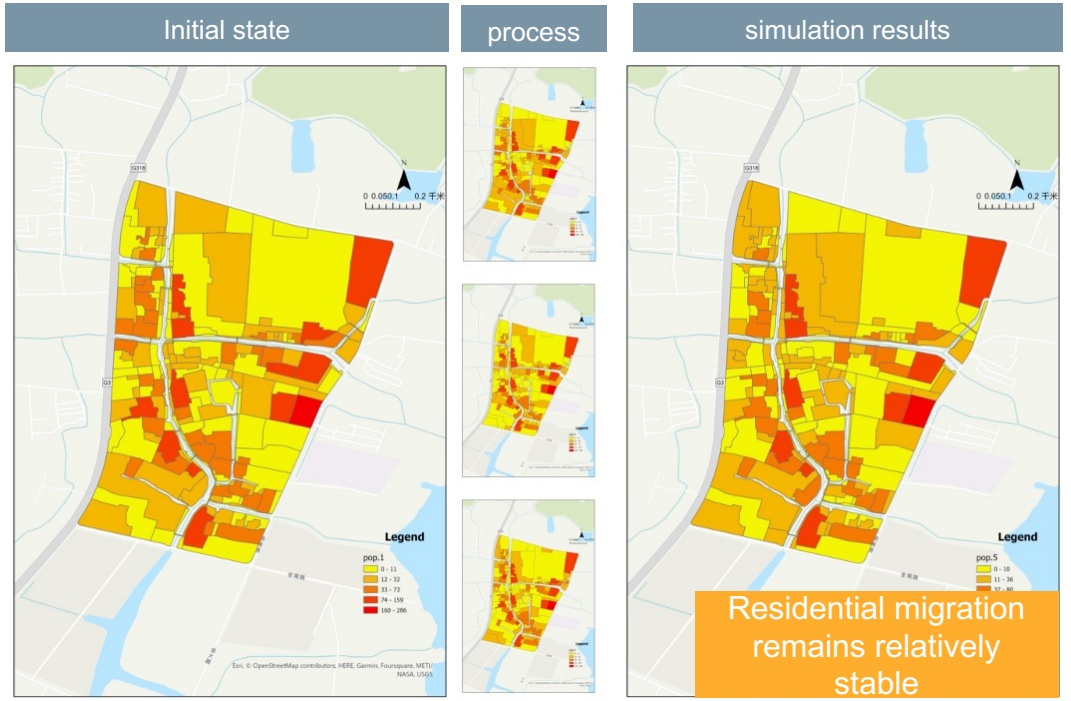
Social scenario simulation based on the ABM model

Comparison of multi-day simulation results for different phase plans—Residential space migration

- Under the 'club-oriented' scenario, there is a significant outward diffusion of residential spaces for local residents, with social displacement risks emerging in high-social-cohesion riverfront areas.
- Through spatial function adjustments in the iterative plan, the spatial mapping of the original social structure did not change significantly during the simulation, indicating that spatial function and structure adjustments have a reinforcing effect on social stability.



Simulation of Local Resident Residential Migration
Based on Current Plan



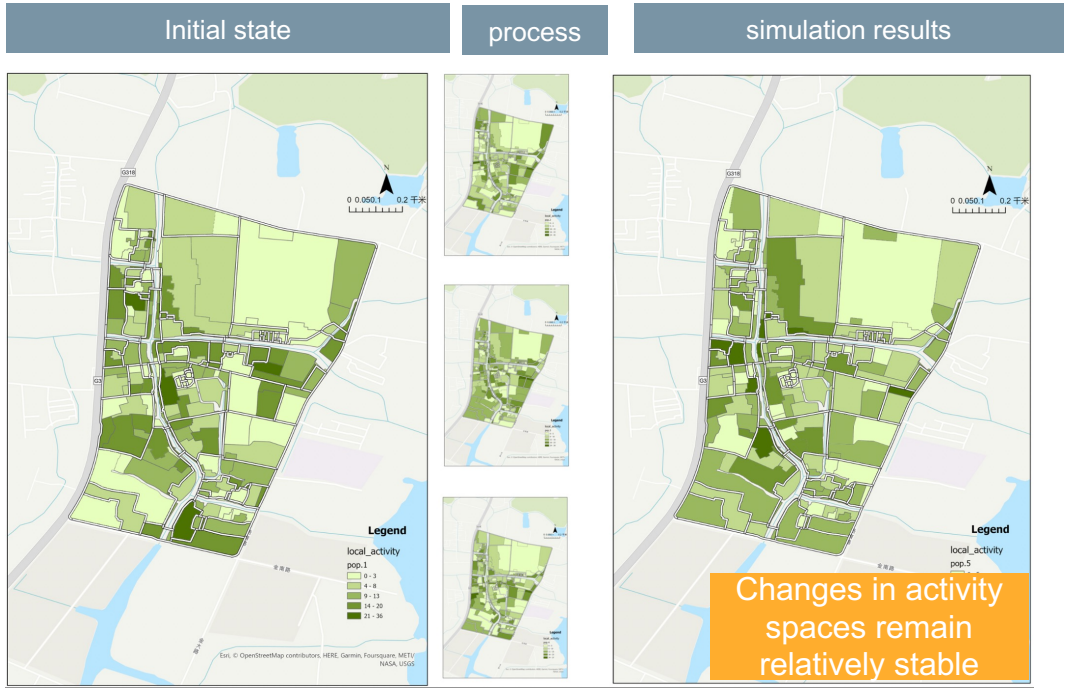
Simulation of Local Resident Residential Migration
Based on Optimized Plan

Social scenario simulation based on the ABM model

Comparison of multi-day simulation results for different phase plans—Activity space migration

- Under the 'club-oriented' scenario, the outward diffusion of local residents' living spaces is significant, and there is a social displacement risk in the high-cohesion riverfront areas.
- Through spatial function adjustments in the iterative plan, the spatial mapping of the original social structure did not show significant changes during the simulation, indicating that spatial function and structure adjustments have a reinforcing effect on social stability.

Simulation of Local Activity space migration Based on Current Plan



Simulation of Local Activity space migration Based on Optimized Plan

Social scenario simulation based on the ABM model

Comparison of multi-day simulation results for different phase plans—Risk Index

- Under the '**over-commercialization**' scenario, the risks of commercialization and inward isolation exhibit varying degrees of spatial clustering.
- **High commercialization risk** values are concentrated in a few areas, such as the eastern bank of Jinze River and the northern side of Jinxi Road. High **inward isolation risk** values are concentrated along the sides of the transverse rivers and the southeastern part of the plot.
- Adjustments in spatial function and structure effectively reduce the occurrence of extreme risk values, significantly improving **spatial balance**